# LOUISIANA Conservationist

LOUISIANA WILD LIFE AND FISHERIES COMMISSION

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## Conservation Pledge

**I give my pledge as an American to save and faithfully to defend from waste the natural resources of my country—its soil and minerals, its forests, waters and wildlife**

*Published Bi-Monthly in the interest of conservation of Louisiana's natural resources by the Wild Life and Fisheries Commission, 400 Royal Street, New Orleans, Louisiana, 70130.*

*It's crawfish time in Louisiana. This eager mudbug fisherman is checking one of his nets. Louisiana produces both red swamp and white river crawfish. It is the only state that produces them for commercial use and they find ready market in the mid-western and eastern states. There's no telling how many millions of pounds are taken annually by commercial fishermen, family groups and folks who farm them in the rice country. Boiled with seasonings, fashioned into world-famous bisque, crawfish etouffe, or served in any other fashion, when it's crawfish time in the State, folks live about as high on the hog as you can get. Every roadside ditch, swampy spot and the bayous and lakes are filled with them. (Cover photo by Robert Dennie)*

# LOUISIANA Conservationist

LOUISIANA WILD LIFE AND FISHERIES COMMISSION

*Subscription Free to Louisiana Residents*
*Upon Written Request*

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# EDITORIAL

MAY CAN RIGHTFULLY be considered the start of the boating season, with accelerated fishing activities in both freshwater and coastal saltwater bodies of water. There will be an increase in water skiing this year, according to national boating estimates. In addition to these activities, there will be a marked increase in simple pleasure boating.

National statistics released early this year by the boating industry reveal that 1965 was a banner year in the sales of boats, motors and trailers. It is anticipated that sales for 1966 will be even greater. These facts plainly indicate there will be more persons on the state's waterways than ever before.

It seems appropriate at this time to stress that boaters of all sorts review the state's boating laws with special emphasis on proper registration and safety equipment. Many new boat owners and operators are not familiar with those requirements. This is equally true of new boat and bait livery operators who rent boats and motors to fishermen.

I would like to stress at this time that it is mandatory that every occupant of any boat, regardless of its size, must have a Coast Guard-approved life jacket. A simple explanation of what is approved and what is not approved is this: All Coast Guard-approved life jackets, life belts, ring buoys, etc., are clearly stamped as approved. Those which are not so stamped simply are not approved and will not be acceptable to either the Coast Guard or the Louisiana Wild Life and Fisheries Commission's water safety patrol boats, or its regular enforcement agents.

It has been clearly demonstrated at national boating safety conferences that adult approved life jackets are not safe for small children and boating families should take careful cognizance of this fact. Buoyancy of the large jacket on a child is such that it tends to turn him over, possibly doing more harm than good. Coast Guard-approved life preservers come in several sizes and are marked for proper age-weight groups. Make certain that children on a boating trip are properly equipped with the right size life preserver.

Section 7-A of the Louisiana Law governing boating also deals with boat liveries and I would like to quote two brief sections which point out specific regulations on the renting of boats to fishermen.

"(1) The owner of a boat livery shall be entitled to register motorboats owned for the purpose of renting to other persons each such boat as herein provided upon the payment of a fee of five dollars per boat for the first three boats and for those in excess of three, the owner shall pay three dollars per boat.

"(2) Neither the owner of a boat livery, nor his agent or employee shall permit any motorboat or any vessel designed or permitted by him to be operated as a motorboat to depart from his premises unless it shall have been provided, either by the owner or renter, with the equipment required pursuant to Section 8 of this Act and any rules and regulations made pursuant thereto."

J. D. HAIR, JR.
Director

Failure to possess life jackets that are of the approved type is one of the most flagrant violations of the boating laws. It is the cause of a great percentage of drownings due to boating activities and strict enforcement of this section of the boating laws will be carried out during the 1966 boating season.

There is another aspect to safe boating I would like to stress. Aside from life jackets for every person in every craft, along with other equipment mandatory for boats falling into various categories according to registration; there is another aspect that must be considered.

Consideration of other boaters can prevent possible personal and property damage. The same common sense that should be displayed upon the highways and streets should also be demonstrated upon the waterways of the state. Slowing down and caution should be exercised in passing other craft, particularly in the case where a larger boat passes a smaller one. Boats that are moored can receive considerable damage from wave wash of passing craft.

Treat other boaters as you would wish them to treat you. Keep in mind there are "rules of the nautical road" just as there are rules for automobile driving. There is no place in boating for horseplay. It can be deadly.

If we all cooperate, collectively we can cut down on boating accidents that bring about large losses in property and often losses in human lives. Let's make 1966 a year of marked boating safety. ✠

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# MORE ABOUT CRAWFISH

**Cecil LaCaze**

THE CRAWFISH, which may be called crayfish, crawcrab, crab, stonecrab, crawdad, creekcrab, yabbie, or other local names, is found in freshwaters on all continents except Africa. There are more than 300 species worldwide, over 100 species in the United States, and 29 known species in Louisiana. In sizes and in colors, the variation is extremely wide; the dwarf crawfish of Louisiana *(Cambarellus shufeldti)* reaches full maturity at about one inch in length, while the giant crawfish of Australia *(Engaeus hystricus)* is reported to reach a length of 16 inches. Colors range from light cream to black, with various shades of yellow, blue, red and green.

The detailed life histories and habits of all species of crawfish is far beyond the scope of this article. Some species, including at least 5 of those found in Louisiana, spend their entire lives in underground burrows. Others go through the reproductive cycle, or survive dry periods, by burrowing and spend the remainder of their lives in various bodies of surface water. The remainder do not burrow. They occupy puddles, ponds, ditches, various running streams, and have been recorded in large lakes at depths up to 104 feet. The number of young produced yearly ranges from about 15 to more than 700. It is interesting to note that crawfish found west of the Rocky Mountains in the United States are closely related to Eurasian crawfish. This fact supported the theory that a land bridge once connected the continents.

In some sections of Hawaii, Australia and Japan the crawfish is regarded as a crop pest. In 1930, our own prized red swamp crawfish was exported to Japan to be used as food for bullfrogs (yes, Virginia, the bullfrogs came from Louisiana in 1918). In 1951, Dr. Matsuzo Veno, who was largely responsible for the introduction of the crawfish to Japan, reported that they were present in the vicinity of Osaka at about 2600 pounds per acre and were causing serious damage by eating young rice shoots. The only possible reason that the writer can produce for a condition of this type would be that there are no Japanese words for "bisque," "etouffe" and "crawfish boil."

In other parts of the world crawfish are regarded as a food resource. They constitute the primary source of protein for some groups of natives in New Guinea. In the larger cities of Europe they are regarded as gourmet items and are sold for as much as 40 cents *each.* The supply of crawfish in Europe is periodically depleted by a bacterial disease and in 1964 it was reported that crawfish from Russia were shipped to Stockholm by airplane. Crawfish farms, which have existed in France since 1880, partly supply the Parisian market. In the United States, a large species of crawfish *(Pacifasticus leniusculus)* is harvested in Oregon and shipped to Los Angeles and other west coast cities as "short lobsters." About $7,000.00 worth of these crawfish are sold annually.

**These fine, fat, meaty crawfish are on their way to an etouffe or a bisque via the housewife's kitchen. They will go to her already processed.**

In Louisiana, where gourmets comprise the bulk of the population, the story is quite different. Annually, when the weather becomes reasonably warm in late winter or early spring, the following invariably occurs:

Deep in the wild Atchafalaya Basin, hardbitten crawfish trappers run chicken wire crawfish "cages." On a good day these men will harvest 200 or more pounds of high quality red swamp and white river crawfish each. In the alligator-grass shallows in the vicinity of Pecan Island and on Lake Pearl near Marksville, and in other places too numerous to mention, professional crawfish trappers ply their trade with cages and lift nets. These men account for most of the harvest of "wild" crawfish. Other professional trappers harvest crawfish in relatively new operations known as crawfish farms, which will be described in some detail.

Still more crawfish are harvested by sport crawfishermen. Singly, or by families and larger groups (ranging in age from about 5 to 95 years) Louisianians invade many of the areas previously described plus roadside ditches, rice fields and canals and any other places which harbor crawfish. Crawfish cages, lift nets and dip nets are usually used but many crawfish are harvested by small boys and girls with pieces of meat tied to the end of a string. The recreational value of these goings on is inestimable. No statistical figures are available, but it is extremely doubtful that many young dyed-in-the-wool crawfishermen will make appearances in juvenile courts.

Crawfish harvesting activities are greatest in the area south of a line running from Lake Charles to Alexandria, east to Marksville and down to Baton Rouge and Lake Pontchartrain. The bulk of the wild crawfish come from the Atchafalaya Basin, where more than 2 million pounds may be harvested in a good year. Currently, there are 3,751 acres of swampland and 2,408 acres of rice land devoted to crawfish farming in 5 parishes immediately west of the Atchafalaya Basin. This represents a drop of about 1/3 over the 1964-1965 season when the bumper crop of wild crawfish, plus a large farm crop, brought the price of live crawfish down to 6 cents a pound. Normally, the lowest prices during a season are 12-15 cents, with a gradual decline from the early season price of 35-50 cents.

The remainder of this article will be devoted to the farming of crawfish in artificial impoundments, a relatively new activity which began about 20 years ago. In 1949, Mr. Percy Viosca reported about 2,000 acres of these farms. Today, as previously mentioned, this acreage exceeds 6,000 acres in 5 parishes, with some farms in other parts of the state possibly not reported.

The following represents the procedures followed by successful crawfish farmers in establishing and maintaining harvestable crawfish populations in artificial impoundments:

Beginning in March, or earlier if possible, a new impoundment is prepared for the stocking of crawfish. If water is present, it should be drained and maintained in a dry condition until about May 1st. If there are low places where water persists, or even stump holes or the like, these should be treated with rotenone (derris root) to rid them of fish. Any county agent can supply information as to a source of supply and the method of treatment. The user should bear in mind, however, that this chemical is reduced in effectiveness at water temperatures below 60 degrees Fahrenheit. Fish are important crawfish predators and their presence should not be underestimated; to attempt to raise crawfish with a high population of fish is much like trying to raise a field crop with a dense growth of weeds. The new crawfish farmer will find that boat-tailed grackles, raccoons, ibises, legless salamanders, predacious water beetles, sea gulls, and a host of other predators will reduce his crop. In addition, crawfish are cannabalistic, which also serves to reduce populations.

By May 1st, a natural growth of vegetation should be present and the field should be flooded. It should be said at this time that a crawfish farmer must have a constant source of water and must be able to control water levels at various times. The flooding and drying operations must be accomplished to coincide with the natural needs of the crawfish. Levees must be in good repair to minimize the possibility of a sudden water drop, which, as will be explained later, can result in a substantial crop loss. Water levels in rice fields

**These Atchafalaya crawfish have been caught, sacked and weighed and will find their way alive to the market or processing plant.**

Crawfishing is always a relaxing occupation. Father and son take time out for refreshments before laying-out their nets.

The entire family can participate in crawfishing This is the reason why it is a popular outdoor recreation in Louisiana.

should be kept as deep as is safely possible and depths in other impoundments up to about 4 feet.

There is considerable controversy about the stocking of crawfish. In an established field where crawfish are harvested annually, stocking has not proved necessary, unless a crawfish population suddenly disappears. This occasionally occurs for reasons that are not completely clear. Migrations, treated rice seeds, disease and other theories have been advanced, but more study is needed in this area. On new farms, the stocking of crawfish in late May, when the price of live crawfish is relatively low, is a common sense investment. It is difficult to estimate the number of crawfish present. If the area to be used has been dry for several years, few red swamp crawfish will be present. Under these conditions it is doubtful that any white river crawfish will be found.

The red swamp crawfish *(Procambarus clarki)* may be stocked in rice fields and other similar shallow impoundments plus deeper water impoundments. Freshly caught adult crawfish should be stocked about the end of May at the rate of 15 pounds per acre, if a crawfish crop is desired the following season. Crawfish which have been in coolers longer than 24 hours are not recommended. No pumping or drainage operations should be performed during the stocking period or for at least a week afterward. The crawfish should be released near the center of the impoundment, as crawfish near the edges are vulnerable to predators during the acclamation period.

Excellent crawfish crops have been achieved by stocking the white river crawfish *(Procambarus blandingi acutus)*. The general concensus of conditions observed, however, indicate that these crawfish are more suited to deeper water impoundments, or impoundments other than rice fields. Preliminary studies indicate that this crawfish produces less young than the red swamp crawfish. This finding is supported by the fact that this species usually fails to produce a large crop the first year, when stocked at about 10-20 pounds per acre. It is apparent that a stocking rate of 25-30 pounds per acre is a more realistic rate for this species. If the species are mixed, the stocking rate should be about 20 pounds per acre.

After the impoundment is stocked the water level should be maintained for at least 3 weeks. The impoundment should then be allowed to dry *slowly*. Any sudden drop of water exposes an unnecessary number of crawfish to predators. One very successful crawfish farmer drys a 500 acre field over a period of 2 months. At this time the females will dig burrows 24-36 inches deep and the crawfish crop is safely underground and "laid by" for the summer. It is then recommended that the crawfish farmer conduct private research on the gastronomic preferences of bass, bluegill and sac-a-lait.

During the summer months, adult female crawfish remain in the cool, clear water at the bottom of the burrows, which are "plugged" against predators. Beginning about September 1st, egg laying begins. The female will tuck her tail tightly under her body and begin to lay eggs from oviducts located at the bases of the third walking legs. On their way to the tail, the eggs pass a sperm receptacle, located between the fourth and fifth walking legs. The sperm, placed in the receptacle by the male by the end of May, fertilize the eggs, which continue to move rearward. The small appendages on the underside of the tail are coated with a sticky substance called glair which holds the eggs in place. While all this is going on the female undergoes an intricate series of "turning" maneuvers, which results in a "ball" of eggs on each small appendage. The female is now "in berry." In 14-21 days the red swamp crawfish will produce as many as 700 young and in about 18-29 days the white river crawfish will produce probably 200-400 young.

Of primary importance at this time is open water for the young crawfish. It has been found that female crawfish will eat a portion of the brood when confined in small areas without food. The crawfish farmer should flood no earlier than September 1st and no later than October 1st. If flooding is delayed, many of the young may be eaten and the growth of the remainder retarded. The water from this flooding will remain in the impoundment until drying time the following year. It is therefore advisable to screen the inflow pipes to prevent the introduction of fish and fish eggs. A relatively new innovation, in the form of a Saran-screen sock, is now available and information concerning this device can be furnished by the writer. The mesh size of any screen that may be devised should be no larger than 1/4 inch, which of course will not prevent the introduction of fish eggs.

Optimum conditions for crawfish after the fall flooding have not been completely determined. Small crawfish grow rapidly, however, in dense beds of alligator-grass *(Alternanthera philoxeroides)*, water primrose *(Jussiaea* spp.), common smartweed *(Polygonum* spp.) and many others. Crawfish feed best at temperatures of 65-80 degrees Fahrenheit, with little feeding activity occurring at temperatures below 45 or above 90 degrees. The exceptionally large wild crawfish crop of 1964-1965 was produced by weather conditions which began with rainfall in early October which exceeded the normal for the month by 7 inches. October was cool, but November and December were mild to normal. Beginning before Christmas, 1964, a bumper crawfish crop was harvested. According to some of the older crawfishermen, this was the largest harvest they could remember. A conservative estimate would put the total harvest in the State at more than 10 million pounds. Other factors may have contributed to this large crop, but the temperature and rainfall coincided with the biological needs of the crawfish.

Assuming that the above conditions have been reasonably well met, there is yet another condition that may hamper the growth of crawfish before harvesting. An excess of decaying material, such as dead weeds and wind-blown leaves, will cause a depletion of oxygen in the water. Unlike true fish, the crawfish can come to the surface and breathe during low oxygen periods, but feeding activity will cease. When large numbers of crawfish are observed resting on objects at the surface and are not actively feeding, or when crawfish are observed "flipping up" to the surface in water a foot or more in depth, low oxygen is indicated. At this time, new water should be pumped into the pond. This last practice invariably stimulates feeding when no fresh water has been added for several weeks, regardless of oxygen problems.

The harvesting and disposition of crawfish may be accomplished in many ways. Wild crawfish may be sold directly by the trapper to consumers, or sold to wholesale dealers. Operators of crawfish farms may charge a daily set fee to each customer, who may then catch his own crawfish, with a restricted number of traps or lift nets. Operators may also pay professional trappers or charge sport crawfishermen about 1/2 the current market price to harvest the crop. In mid-March of this year the economics of a large crawfish operation were essentially as follows: Professional crawfish trappers, baiting "cages" with shad and rough fish heads, obtained at 5-6 cents a pound, were harvesting the farmer's crawfish for 13 cents a pound. These crawfish were hauled by the owner from the impoundment to the farm-owned processing plant, where the tail meat and fat (hepato-pancreas) were removed by ladies working as crawfish peelers for 25 cents a pound. Live crawfish were sold at 25 cents a pound and tail meat, exclusive of the associated fat, for $2.15 a pound. As many as 1,000 pounds of tail meat

**The above is what would be called a representative catch of fine crawfish that any crawfisherman would be proud of.**

**Modern steam kettles are used for processing crawfish for the waiting market. It is a far cry from grandma's old washtub.**

No one knows how many thousands of pounds of crawfish are caught by the non-professionals for home consumption. Such figures are of course impossible to compile.

These crawfish have been seasoned and boiled and will be marketed in these plastic bags. More and more crawfish are reaching the public through this processing.

a day could be processed. The writer hastens to add, however, that the market sometimes fluctuates widely and that no phase of this work, particularly trapping and peeling tails, could be classed as easy.

The tail meat is placed in plastic bags and packed in ice with small cartons of fat, without which no true chef will cook the prized crawfish dishes.

A good crawfish operation will produce 300 or more pounds of crawfish per acre annually. For various reasons, it is difficult to determine the exact production, but some impoundments are thought to produce more than 800 pounds per acre.

There are distinct advantages and disadvantages involved in the various types of crawfish operations. The rice farmer obviously cannot take advantage of all the steps outlined above in a field in which rice is grown simultaneously with the crawfish crop. His field must retain water during the normally dry months. After the rice is harvested in the fall, the field is relatively clear of vegetation and resprouted rice and old rice straw are usually the only available plant foods present when flooding time arrives. Crawfish harvested from this type impoundment are of high quality but are generally smaller than those of other types. The advantage of rice field crawfish farming lies in the fact that the impoundment is already established. The expense of raising crawfish in this type of operation consists of initial stocking and water control costs. Rice fields are usually accessible and easily fished with traps and lift nets.

Other impoundments are initially costly, but the farmer can control vegetation and water levels without regard for rice crops. It has been established that crawfish need and will consume animal matter in small amounts in the form of small in-

Crawfish from well vegetated impoundments are meaty and fat and much sought for on the market.

These large, live crawfish are ready for the market or for the processing plant.

sect larvae and the like, but they are not active predators and vegetation constitutes the bulk of their diet. Some of these impoundments are relatively inaccessible and the densely wooded portions of some of the areas make trapping difficult.

The above areas have the distinct advantage of water control. In mid-March of the current season, when crawfish prices were high, trappers in the Atchafalaya Basin were not able to reach areas known to contain harvestable numbers of crawfish because of low water. A variety of water level needs and controls in the Red—Mississippi—Atchafalaya complex prevents the maintenance of water levels suitable for the propagation and harvest of crawfish in this area. At about the same time the Pecan Island area was drying up and the crawfishermen were moving elsewhere. From year to year the harvest of crawfish in these areas is subject to wide variation.

The obvious advantage of the wild crawfish areas is the cost of producing crawfish, which is nil. Dependency on natural water fluctuations, however, prevents an accurate prediction of production and income from crawfish prior to a particular season.

Currently, research is being conducted on the biological-ecological aspects of crawfish at Louisiana State University. The University of Southwestern Louisiana is conducting research on crawfish processing; the fat previously mentioned presents a preservation problem over long periods which has not been resolved. One student at McNeese State College is investigating the tolerance of crawfish to salt water. The writer is in the beginning stages of research on the supplemental feeding of crawfish and investigation of cheaper, more consistently available baits for traps, plus other long term projects. This research will be conducted for the Louisiana Wild Life and Fisheries Commission.

The preceding portion of this article represents a summation of knowledge gained by the late Mr. Percy Viosca of the Commission; Mr. Carl Thomas of the Soil Conservation Service; Mr. Semmes Lynch of the Louisiana Department of Agriculture; Mr. Leland Sexton of Rosedale, Louisiana; crawfish and/or rice farmers LeRoy Miller, John Ruppert, Elmer Naquin and Garland Wright and many trappers and others associated with the industry, plus information or refinements discovered by the writer during graduate study at L.S.U.

Potential crawfish farmers are advised to start *small*. More study is needed to determine the soil and water composition of areas in which crawfish will grow to marketable size. It is felt that any area which contains reasonably large numbers of native crawfish will be suitable for farms, but to avoid large losses the new crawfish farmer should initiate the procedures previously outlined in a small portion of the larger area to be farmed for one growing season. It is then suggested that these crawfish, if sufficient numbers are present, be used to stock the larger impoundment. About 1/10 of the area could be tried initially, which should produce enough crawfish for stocking, if conditions are favorable. The above procedure is strongly suggested in areas generally outside the present regions where crawfish are grown.

The future of the crawfish industry looks bright. The primary reason for this (if the word of a displaced red-neck can be taken) is that each plate of bisque or etouffe consumed by the novice crawfish eater usually creates a new customer. ✠

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## WILDLIFE SHORTS

Louisiana's seed oyster grounds are never leased to private individuals; for the most part they lie east of the Mississippi River in low salinity areas where disease and predation are not a problem.

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You need not beware of Louisiana's horrendous "Congo Eel", he's as harmless as a kitten, edible, and not really an eel but a salamander who strictly minds his own business.

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Privately leased Louisiana oyster growing lands (bottoms) are in more saline areas on each side of the Mississippi River Delta. They consist of 83,000 acres of scattered leases ranging from a few acres to several hundred acres in size, and located from the Mississippi line to Western Vermilion Bay.

# LOUISIANA'S FISH HATCHERIES

### Sammy Stokes

THE LOUISIANA WILD LIFE and Fisheries Commission now owns or operates three state fish hatcheries. These are: the James A. Noe Hatchery at Monroe; the Beechwood Fish Hatchery near Forest Hill; and the Huey P. Long Hatchery in Lacombe. The primary purpose of these fish hatcheries is to improve sport fishing success throughout Louisiana. Hatchery operation involves hatching fresh water sport fish eggs and growing them in fingerling size. These small fish are then stocked in impoundments, lakes, farm ponds and other water areas meeting the necessary requirements.

Our hatcheries produce the following species of fish for stocking purposes: bluegill sunfish, largemouth black bass, black crappie and channel catfish. There are two ponds at the Lacombe Hatchery that contain experimental species, namely Tilapia and striped bass. The striped bass is a native to Louisiana but has never been reared or cultured in hatchery ponds.

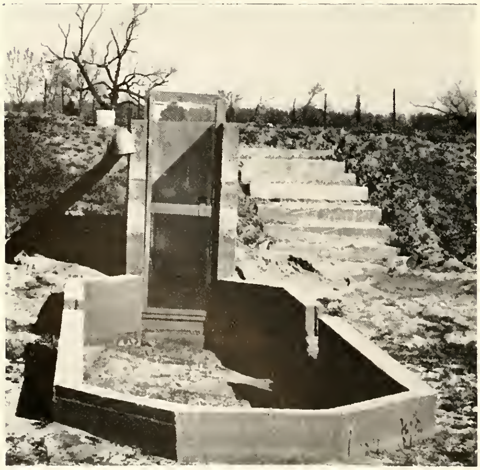
The production of native species which were stocked in 1965, included 2,679,558 bluegill, 328,610 largemouth bass, 198,160 black crappie and 110,200 channel catfish. With the exception of the channel catfish these fry and fingerlings were stocked in approximately 120 impoundments, both private and public, throughout the state. The channel catfish were exchanged with the Nebraska Game and Fish Commission in return for 1,000,000 walleye fry and 2,000,000 walleye eggs. The production of channel catfish is very limited at this time and none has been generally stocked in public water areas.

The public areas stocked included Zemurray Park Lake, Joe Brown Memorial Park Lake, Lake Vernon, Cotile Reservoir, Clear Lake, Desoto Parish, Bayou Macon Cutoffs 1, 2 and 3, D'Arbonne Lake, Lake St. Joseph, Lake Bruin, Chicot Lake, Kepler Creek Lake, Bayou Rouge and Sabine River.

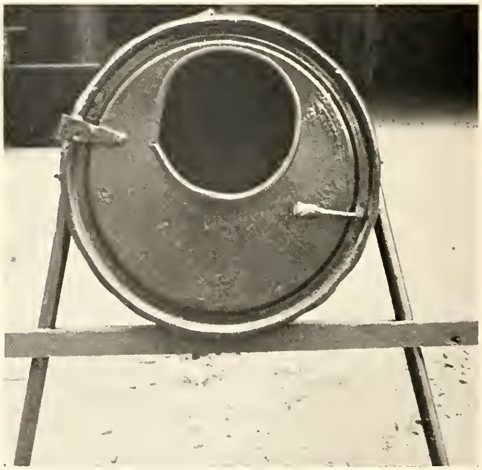
Fish production begins at the state hatcheries with the bluegill. Brood fish are paired, counted and placed in clean ponds freshly filled with water. This stocking operation usually takes place in June. Since bluegill are not predaceous or carnivorous, the adult fish are allowed to remain in the ponds in which they spawned until harvest time. At harvest time, usually November through January, the ponds are drained into a catchbasin. The fry are then collected by seining methods, placed in water filled tanks, transported to a holding shed and placed in vats. The fingerlings are graded, counted, weighed and placed in aerated tanks on fish transport trucks and carried to their destination.

After the bluegill are harvested, the ponds are again filled and brood bass are paired and counted then placed in the ponds to spawn. The only exception is that the adult bass are removed from the spawning ponds immediately after the bass fry are hatched. Since bass are carnivorous, they would seriously reduce the number of fingerlings harvested. Black crappie brood fish are stocked at the same time as the largemouth bass but in separate ponds. Harvesting operations are much the same as the bluegill.

The production of channel catfish required somewhat different techniques. The brood channel catfish are paired, counted and placed in ponds



Spawning container used in the production of channel catfish.



A kettle or catch basin used in collecting fingerling fish during harvesting operations.

Experimental frog production ponds being constructed at Beechwood Fish Hatchery.

filled with clean fresh water; however, spawning containers must be placed in these ponds or the channel catfish will not reproduce. The normal time in which brood catfish are placed in the spawning ponds is May or June of each year. As time nears for the channel catfish to spawn, the spawning containers are checked several times weekly. After spawning the eggs are checked daily until they hatch. The fry catfish are then removed from the container and transferred to a rearing pond until time for harvesting. These fingerlings are removed in November or December in the same manner as the bluegill.

In addition to normal production there are three species of fish that are now under study by the Louisiana Wild Life and Fisheries Commission. They are the Tilapia, striped bass and the walleye.

The Tilapia is successfully produced at the Lacombe Hatchery since they require comparatively high water temperatures for survival. They die at temperatures below 48 degrees Fahrenheit and stop feeding at 60 degrees Fahrenheit. The water supply at Lacombe is from artesian wells and flows are constant all year. The temperature is approximately 70 degrees Fahrenheit and does not vary throughout the year. Subsequently, Tilapia have survived and been produced very successfully at Lacombe. Attempts to overwinter this species at the Monroe and Beechwood hatcheries failed because of low water temperatures.

This species was experimentally stocked in several ponds in the state but failed to survive in any of them. The only area in which a population has been established in Coughlin Lake, a seven acre impoundment constructed by the Central Louisiana Electric Company in St. Landry Parish. There is a power plant near this impoundment which procures its water supply from Bayou Cocodrie and discharges it into the impoundment. The water discharged into the impoundment is approximately 30 degrees above the normal water temperature, thus, having the same effect on the impoundment as the artesian wells do at the Lacombe Hatchery. Tilapia were stocked in this impoundment in the Spring of 1963; numbers of the species were harvested as recently as the summer of 1965, living proof that the species has reproduced. One desirable thing about Tilapia is that it would never present population problems due to its narrow temperature tolerance.

The second species under study at present is the striped bass. During May of 1965, approximately 450,000 fry were obtained from the the South Carolina Department of Wildlife Resources. These fry were flown to Monroe in plastic bags. Ninety thousand were placed in ponds at Monroe and 360,000 were placed in an eight acre pond at Beechwood Hatchery. Attempts were made to harvest the fingerlings in July 1965. All harvest methods used were generally unsuccessful. Removal was then postponed until November. At the time of removal, the total number harvested had dwindled from the original 450,000 to a little less than 10,000. The mid July drawdown at Beechwood was very detrimental to the population and an estimated six to ten thousand died from lack of oxygen. Of the remaining 2,500 harvested, approximately 2,300 died due to their highly nervous nature. These fish apparently went into shock and never recovered.

The 8,850 survivors were placed in D'Arbonne Lake near Farmerville, Louisiana, and in the Sabine River near Leesville, Louisiana. Our hopes are to establish a harvestable population in the Toledo Bend Reservoir on the Sabine River comparable to the Santee-Cooper Reservoir in South Carolina. The striped bass is highly regarded as a sport fish and should provide a biological control on certain species of trash fish because of their highly predacious nature.

One hundred fifty-seven striped bass were

*(Continued on page 23)*

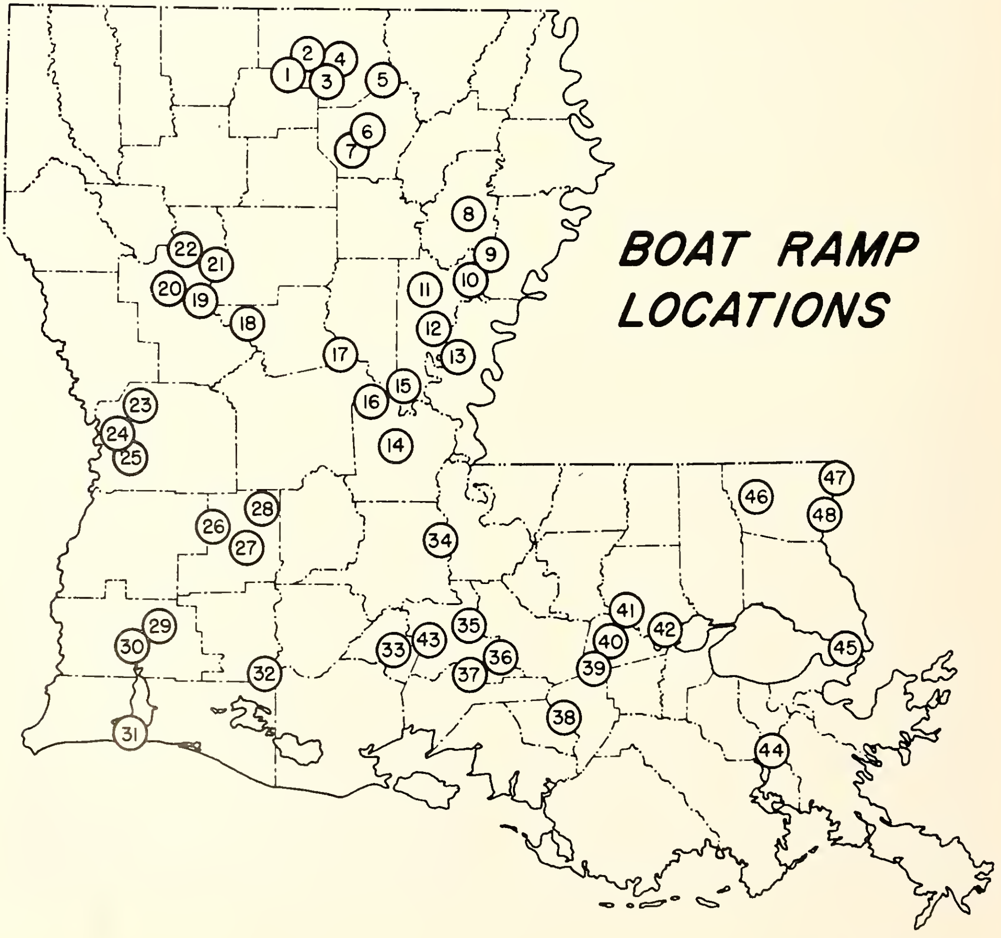
# BOAT RAMPS

One of the most successful programs the Louisiana Wild Life and Fisheries Commission has ever undertaken will probably be completed within a month from the time this edition goes to press. This is the boat ramp and parking area construction project which began in October of 1962 and has seen the completion of 43 boat ramps, the majority with parking areas, in 31 parishes. Five additional ramps are under construction, delayed due to high water and difficult working conditions.

This program was made possible by utilizing funds made available through the Accelerated Public Works program, administered by the U. S. Department of Commerce. These funds were matched by equal amounts of money from Louisiana. Only those parishes which were declared economically depressed areas were eligible to receive the benefits of the APW program, the purpose of the whole project being to improve the economy of these areas. This program, however, has been phased out.

The Wild Life and Fisheries Commission is planning to launch a new boat ramp construction program in 1966-67. The legislature is being requested to appropriate $250,000 out of the Commission conservation fund in the May-June session to finance the building of new ramps on State owned lakes. Probably federal funds will be made available to provide matching monies to help finance new ramps through the U. S. Bureau of Outdoor Recreation program.

Thirteen of the APW ramps were constructed by the Louisiana Department of Highways. That



agency drew up the specifications, supervised construction and furnished funds on a 50-50 basis to match APW money made available by the Louisiana Wild Life and Fisheries Commission. A few of the Highway Department ramps were shell, but most were concrete, good examples of such being those at Prien Park on Calcasieu Lake, Calcasieu River at Lake Charles and Amite River at Port Vincent.

All concrete ramps have been designed to provide a minimum launching width of 24 feet, are 6 inches thick with steel reinforcing and have a maximum slope of 15 per cent. An adjacent parking lot has been provided at practically all locations, these averaging from one to four acres and usually surfaced with shell or gravel. Many of the later designs provided for a wooden pier on one or both sides of the incline, a feature which allows the boat to be loaded after launching without having to get your feet wet. In addition, the pier eases launching traffic on a busy day because a boat can be launched and moved from the ramp to be loaded; thereby, making room for another rig to be backed into the water.

Lack of access to public waters has prevented proper utilization of many miles of fishing streams and lakes which afford fishing which actually is as excellent as that found anywhere else in the world. An example is the extensive waterways complex in the Larto-Saline Lake area. One of the APW ramps has been constructed on Saline Bayou, near the end of the Hunt Oil Company road, which will furnish access to both Larto and Saline Lakes as well as to Saline and Cross Bayou. The Louisiana Wild Life and Fisheries Commission has plans for additional ramps and camping areas on this commission-owned 60,000 acre tract, known as the Saline Wildlife Management Area in lower LaSalle and Catahoula Parishes.

The following is a list of all ramps completed and under construction. Those not yet complete are located on the Pearl River, one at Angie and one at Bogalusa, one on the Bogue Chitto River at Franklinton, one at Fort Pike and one at Rosethorn Park in Jefferson Parish.

1. **Lake D'Arbonne, Lincoln Parish; Unionville**
2. **Lake D'Arbonne, Union Parish; Bayou Corney**
3. **Lake D'Arbonne, Union Parish; South End of Dam**
4. **Lake D'Arbonne, Union Parish; North End of Dam**
5. **Ouachita River, Union Parish**
6. **Cheniere Lake, Ouachita Parish; Area 1**
7. **Cheniere Lake, Ouachita Parish; Area 4**
8. **Bayou Macon, Franklin Parish**
9. **Tensas River, Franklin Parish; Cooter Point**
10. **Bayou Falcon, Catahoula Parish; Sicily Island**
11. **Ouachita River, Catahoula Parish**
12. **Black River, Catahoula Parish; Jonesville**
13. **Horseshoe Lake, Concordia Parish**
14. **Old River, Avoyelles Parish; Mansura**
15. **Saline Bayou, Catahoula Parish**
16. **Big Creek, Avoyelles Parish at North Point**
17. **Little River, Grant Parish**
18. **Nantachie Lake, Grant Parish**
19. **Cane River Lake, Natchitoches Parish**
20. **Sibley Lake, Natchitoches Parish**
21. **Clear Lake, Natchitoches Parish; Sandy Point**
22. **Black Lake, Natchitoches Parish; near Campti**
23. **Lake Vernon, Vernon Parish**
24. **Lower Anacoco, Vernon Parish**
25. **Lower Anacoco, Vernon Parish**
26. **Whiskey Chitto, Allen Parish**
27. **Calcasieu River, Allen Parish**
28. **Calcasieu River, Oakdale**
29. **Calcasieu River, Lake Charles**
30. **Prien Park, Calcasieu Parish**
31. **Calcasieu Lake, Cameron Parish**
32. **Lake Arthur, Jefferson Davis Parish**
33. **Vermilion River, Lafayette Parish**
34. **Half-Moon Lake, St. Landry Parish**
35. **Atchafalaya River, St. Martin Parish; Butte LaRose**
36. **Bayou Benoit, St. Martin Parish**
37. **Lake Dauterive, St. Martin Parish**
38. **Lake Verret, Assumption Parish**
39. **Mississippi River at Donaldsonville, Ascension Parish**
40. **Bayou Francois, Ascension Parish**
41. **Amite River, Ascension Parish**
42. **Chene Blanc Canal, Livingston Parish; Chinquapin Inn**
43. **Lake Martin, St. Martin Parish**
44. **Rosethorn, Jefferson Parish**
45. **Fort Pike, Orleans Parish**
46. **Bogue Chitto, Washington Parish; Franklinton**
47. **Pearl River, Washington Parish; Angie**
48. **Pearl River, Washington Parish; Bogalusa**

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## WILDLIFE SHORTS

In general Louisiana seed oysters are selected and planted in September, October and November when they reach the age of 12 to 16 months and a size of 2½ to 3 inches. From September to March they grow rapidly, reaching 4 to 5 inches in length and become more salty.

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In Louisiana, the state owns and manages some 450,000 acres of natural seed grounds where oysters grow wild. In this area seasons are set for the taking of seed oysters depending upon annual conditions. Oyster growers are allowed as to gather wild seed oysters for planting on their privately leased grounds where they are culled, separated, planted to get maximum food and growth harvested. This process is usually an annual operation, although in some cases may occur over a two year period.

# 27th Wildlife Federation

Sam A. Frisby, Pineville president of the Louisiana Wildlife Federation, is shown opening the 27th Annual Convention which was held in New Orleans March 18, 19 and 20 at the Fontainebleau Motor Hotel.

The official address of welcome delivered by Col. James A. Moreau, State Representative and Councilman-Elect, New Orleans District D. During his years in the Legislature, Col. Moreau served on the vital Fish and Game Committee and greatly supported legislation that was conducive to wise use of natural resources.

One of the principal speakers at the opening assembly was an address by Dr. Frank A. Hayes, D.V.M., Director, Southeastern Cooperative Wildlife Disease Study, School of Veterinary Medicine, University of Georgia, Athens, Ga. He spoke on "Deer Herd Management in Louisiana—Forward or Backward." Dr. Hayes is considered one of the country's foremost authorities on parasites in wildlife, particularly deer.

Mike Cook, right, out-going president of the Louisiana Outdoor Writers Association which met in conjunction with the Louisiana Wildlife Federation, is shown presenting the LOWA Conservationist of the Year Award to A. C. Glassell, Shreveport, who was recognized for his many contributions in wildlife conservation. John Blanchard, Bastrop, was elected president of the LOWA; Paul Kalman, New Orleans, vice president; and Steve Harmon, Baton Rouge was re-elected secretary-treasurer.

Clint Bridgeman, left, is shown receiving the George Connell Memorial Award from Clyde D. Smith, new president of the Louisiana Wildlife Federation.

Lieutenant Governor C. C. "Taddy" Aycock, representing Governor John J. McKeithen, is shown presented Walt Day, Norco, with the Governor's Award, presented to the Outstanding Conservationist of the Year.

# Convention in New Orleans

Charles Bosch, left, Executive Director of the Louisiana Wildlife Federation, is shown presenting the Fred McCormac Memorial Club Membership Award to Francis J. Braud, Norco, member of the Norco Boating Club and the Bonnet Carre Rod and Gun Club. The late Fred McCormac was one of the prime movers behind organization of the Louisiana Wildlife Federation and worked day and night to build up its membership. The award is presented to a federation club that shows the greatest membership gain during the year.

Other award winners of the Governor's Awards program, sponsored by the Louisiana Wildlife Federation, the National Wildlife Federation and the Sears Foundation, are shown with their statuettes. From left to right, back row, are: George R. Bagley, president of the Louisiana Association of Soil and Water Conservation District Supervisors — Conservation Organization of the Year; George B. Franklin, Jr., Wildlife Conservationist of the Year; and Edgar R. Butts, Youth Conservationist of the Year. Front row, left to right: State Senator Harold Montgomery, Legislative Conservationist of the Year; Wilbur Dyer, Water Conservationist of the Year; and Walt N. Day, Governor's Award.

During convention proceedings, the Louisiana Wildlife Federation's new slate of officers were elected. Shown from left to right, they are: Wyatt Jackson, Shreveport, 1st Vice President; Charles Bosch, Baton Rouge, Executive Director; Ralph Kling, Sr., Gonzales, Treasurer; Clyde D. Smith, New Orleans, President; Arthur L. Darnsteadt, Jr., West Lake, 2nd Vice President; and Charles F. Buckley, Alexandria, Secretary. Smith succeeded Sam A. Frisby as president.

McFadden Duffy, Louisiana Wild Life and Fisheries Commission, is shown receiving a Mountain Lion statuette from Lieutenant Governor Aycock.

Dr. Lyle S. St. Amant, assistant director of the Louisiana Wild Life and Fisheries Commission, spoke on "The Effects of Hurricane Betsy on the Fisheries Industries."

# 88-309

# IT'S ON THE WAY!

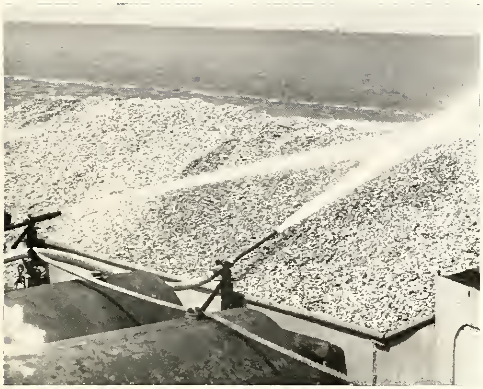
**Ted B. Ford**

THIS IS THE NEW "Commercial Fisheries Research and Development Program". It was enacted by Congress and signed into law by the President in July 1964. The Act provides for the expansion of work in research, development and management for the commercial fisheries of the several states through a matching funds program.

The Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, was designated by the Secretary of the Department of Interior to administer this six million dollar per year program for the five year term. Louisiana is one of six states scheduled to receive the maximum annual allotment of $300,000.00 when the full authorization is appropriated by Congress. Governor John J. McKeithen designated the Wild Life and Fisheries Commission to administer the program in Louisiana, and Director J. D. Hair, Jr. named the Division of Oysters, Water Bottoms and Seafoods to direct and supervise the program within the Commission. Several projects were proposed and approved in principle. Specific approval and allotment of funds for the current year through an annual project agreement was completed in late February.

Seeds for this program were planted several years ago when Sen. Gruening (D. Alaska) introduced a bill in Congress to support the marine commercial fisheries research programs of the several states. The Gulf States Marine Fisheries Commission, of which we are a member, supported this bill, but it failed to pass in that Congress. Then, Sen. Bartlett of Alaska introduced a similar bill in the new Congress. Shortly afterwards, he was in New Orleans briefly for an interstate commerce meeting and visited with officials of the Commission. A two hour flight over Louisiana's southeastern marshes was arranged. This, coupled with a hurried discussion about some of our problems and work programs, gave him a limited exposure to the Gulf area. Nevertheless, it supported and reinforced his interest in the need for this type of legislation to assist the states trying to help themselves. Locally, The Gulf States Marine Fisheries Commission, Louisiana

In the past, the principal research conducted at the Marine Research Laboratory at Grand Terre was limited in great part to the greater Barataria Bay area. The new program will provide scientific and support personnel and equipment to work throughout the entire coastal area. It will enable expansion and intensification of the biological program into all fields of fisheries research and management and will also permit development work such as the oyster lease control monuments and shell plantings.


**The Commission will be able to extend its fisheries research with the new funds made available. It is contemplated that new areas will be planted with shells as seen above. The newly planted beds will form a nucleus for oysters to spawn and research will continue on an extended scale. These shells are being planted hydraulically and will form a perfect pattern on the water bottom and will be ready to receive the newborn oyster cultch.**

Shrimp Association and Wildlife and Fisheries Commission, actively and substantially supported this and the companion House Bill by representatives of these groups making several trips to Washington to discuss it with our Congressional delegations and testify before the Sub-Committee hearings. In its course through Congress, the bill was broadened to include all states, even though many would be limited to the minimal allotment.

Provisions under the law and regulations generally provide that $5,000,000 (when appropriated in full) will be divided among and available to the several states on a matching funds basis. The disbursement formula for the authorized program is based upon the landings and processing of commercial fisheries within or derived from each state, with a minimum of $25,000.00 and a maximum of $300,000.00 annually. Each state has up to two years to obligate its share without losing the alloted amount. Louisiana, being one of the top six states nationally in commercial fisheries production will receive the maximum amount available from the general fund appropriation for any given year. Our high level of production is due chiefly to the dollar value of the shrimp and oyster fisheries and the poundage value of menhaden landings. Currently, Louisiana's allotment is $246,000.00. Requirements are that any project must be substantial in scope and of benefit to the state's commercial fisheries. Cost-sharing is variable: i.e., if the project is local in nature, funding will be 50% state and 50% federal; whereas, if it is regional or national in scope, it will be 25% state and 75% federal.

Another section of the law provides for up to $400,000.00 to be available without matching funds for use in the case of natural disasters happening to any fishery throughout the country. In our area, Hurricane "Betsy" severely damaged the oyster industry. In our opinion the most effective help under this phase of the program would be through a shell planting program to assure a good source and stock of seed oysters in 1967. Accordingly, the project proposal and agreement was submitted recently for a $100,000.00 shell planting program for May and June of 1966. Initially, plans were made for requesting the full amount. However, after conferences with authorities in Washington concerning national and international situations, it was concluded that the reduced amount was more feasible. We favorable consideration and approval in late February.

A balanced program was proposed and submitted under the matching funds program according to our greatest immediate needs. Even so, provision was made to meet general basic needs applicable and useful to the overall marine fisheries on a continuing basis for a long time. Immediate specific needs were also included. A summary of each proposed project follows:

1. *Coordination*—to provide supervision and administration of Public Law 88-309 projects in Louisiana; three years duration for $16,800.00.
2. *Coastwide Study of Penaeid Shrimp*—to study the life history of the commercially important species of penaeid shrimp in the estuarine waters of Louisiana for the improved management of these resources, including a coordinating effort through the Shrimp Committee of the Gulf States Marine Fisheries Commission; three years duration for $406,400.00.
3. *Ecology of Louisiana's Estuarine Waters*—to study the composition, general distribution and relative abundance of the commercially (or potentially) important marine fauna in the estuarine and near

**Water samples are centrifuged in studying the plankton of coastal Louisiana.**

offshore waters of Louisiana, as well as, the ecological factors influencing this fauna and possible means of preserving these estuarine areas; three year duration for $362,000.00.

*Note: Projects two and three are companion projects, utilizing the same staff and much of the same equipment. They were separated mainly for purposes of control and reporting. Both projects will collect extensive hydrographic data for defining temperature, salinity, etc., parameters which influence the different environments of all marine animals in Louisiana's coastal waters.*

4. *Shell Planting for Oyster Cultch*—to replenish cultch material on natural reefs for growing more seed oysters; one year duration for $65,000.00. (This project was planned before "Hurricane Betsy" and would be in addition to the natural catastrophe project amounting to $100,000.00.)
5. *Oyster Lease Control Monuments*—to establish control monuments in coastal Louisiana's marshes where oysters are grown for making more accurate surveys of water bottoms for leasing purposes; three year duration for $230,700.00. (This system of permanent markers will be extremely helpful in specific instances to other fisheries work.)

The federal program was designed to bring about a critically needed expansion of work in this country's commercial fisheries by the several states and to encourage them to broaden their programs with new work. Accordingly, additional state funds were required as matching funds. Proposed first year state costs for the projects summarized above amount to $100,437.50 and the federal costs will be $236,312.50. We secured a requested allotment of $110,000.00 in additional dedicated state funds to implement this program this year. The total estimated cost for the three year term of these projects is $1,080,900.00. Additional projects relative to other state fisheries are being considered to fully obligate all funds as they become available and to meet current and future needs of Louisiana's commercial fisheries.

What does this program mean to Louisiana? (1) It will provide for an increase in scientific and support personnel and equipment to work throughout the coastal area. Previously, we were limited to work out of the Marine Laboratory comprising chiefly the Great Barataria Bay area, except for a "one-shot" sampling trip into other areas once or twice a year. (2) It will enable us to expand and intensify the biological program in other fields of fisheries research and management. (3) It will permit development work, such as the oyster lease control monuments and shell plantings mentioned above which will be most helpful to the commercial fisheries of Louisiana in meeting their needs. (4) Some state funds, previously allocated for the more urgent and important shrimp and oyster work, can now be directed towards other fisheries. Included among these are the menhaden, food finfisheries, industrial fisheries, and blue crab fisheries. All of this work relates to or includes fishery statistics, gear research and development, promotion, and other aspects of commercial fisheries.

In conclusion, it should be evident from the above that this program should provide for a substantial and significant amount of work in the field of commercial fisheries in Louisiana. The program is geared to provide immediate knowledge related to the annual shrimp crop, survey monuments in heavily congested oyster areas, seed oysters for the 1967 bedding season, and cumulative data on the coastal marine environment. Although much of this program has been in the planning stages for several years, authorization for funds and additional personnel have limited previous work. Many of you will recognize that this program is similar to the federal aid to wildlife and sport fisheries programs which have been highly effective in Louisiana. Federal funds for those two programs are dedicated for those purposes and are relatively constant, being derived from excise taxes at the manufacturer's level on hunting and sport fishing gear. This program is different in that federal funds are derived from general tax monies and are subject to Congressional appropriation and the White House's Bureau of Budget review in addition to supervision and administration by the Bureau of Commercial Fisheries. Although the program is authorized for a five-year term, we are optimistic that it will be extended. It will contribute greatly to a much needed expansion of work in research, development and management for the commercial fisheries industry of Louisiana and the United States. ✠

**The identification of marine animals comprising samples from Louisiana's estaurine waters will be a demanding task.**

# The Law's Thin Line

**John Madson and Ed Kozicky**

Federal waterfowl baiting regulations confuse more than they enlighten. They prohibit you from carrying bait to your hunting area, but you may take your hunting area to the bait— if you own or lease land and follow "normal" or "valid" harvest operations.

It is not unlawful simply to feed waterfowls. However, it is illegal to spread any bait in an effort to lure waterfowl to the hunter. A man can be arrested if a few kernels of grain are found in front of his blind, goose pit, or whereever he plans to shoot. Even though he may be innocent, those kernels can convict him.

Proper management of marshes to attract and hold waterfowl is not considered baiting. On the contrary, it is and should be encouraged. Here, a tremendous concentration of blue and snow geese are using such a marsh in coastal Louisiana. When hunted on managed marshes, waterfowlers can be assured that there is no violation of either federal or state laws. Every effort is being made to enhance wintering habitat which in turn affords good hunting.

Dove hunters in particular are deeply concerned by the question of whether they are shooting on a baited field. This hunter is retrieving a dove that was shot in a corn field which has been hogged down. The baiting law clearly provides that any grain left in a field following normal agricultural procedures is not considered unlawful baiting. The same is true when fields are planted in the late summer for winter pasture. Even though some seeds are not covered and attract doves, this is not considered baiting.

On the other hand, you can lawfully build a duck blind or pit in or beside a field of standing grain, flooded grain, or a field strewn with grain after a "normal" or "valid" harvest. The words "normal" and "valid" are not defined. Normal for where? Valid for what? It is a matter of personal judgment for federal game management agents, and places an unfair burden of responsibility on the shoulders of these devoted public servants.

The purposes of the anti-baiting regulations are thwarted by the fact that it is so simple to bait lawfully—providing you own or lease land near concentrations of migrating or wintering waterfowl. The man who can afford to own or lease such land may establish feeder fields for waterfowl and bait on a grand scale. A landless hunter, by law, is not allowed the same privilege.

Feeder fields can be of great importance, especially in or near wintering areas. The Bureau of Sport Fisheries and Wildlife has even issued handbooks on "farming for waterfowl," telling how to plant foods attractive to ducks and geese. This is standard practice on official waterfowl refuges and on many private duck clubs, and no flyway can afford to lose such tailor-made waterfowl habitats.

However, these are all problems of management. The purpose of hunting regulations is to provide an equitable opportunity for license holders to harvest the annual crop. And when one reviews the baiting regulations, it is apparent that there is an almost invisible line between the lawful and the unlawful, that the same sun does not shine on all hunters alike, and that we hunt waterfowl under a double standard.

Whether the practice of baiting is "good" or "bad" is beside the point. The present baiting laws are not equitable to all hunters. Should we tolerate such inequity in the hunting regulation of a public resource? We don't thing so. ✱

## Fish Farming Profitable Industry

# CATFISH BY THE ACRE

**McFadden Duffy**

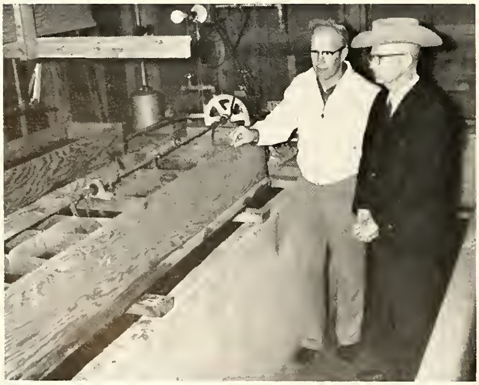
TODAY IN LOUISIANA when you hear a man mention that he has 20, 40 or over 500 acres "planted" in catfish, don't look bewildered. He means just what he is saying. And as time goes by, you're going to hear more and more talk about acres of catfish. The reason is simple. The present supply simply does not meet the demand. Today, only about 25 per cent of the national demand can be met.

We found this out in an interview with Jim Davis, fisheries research biologist for the Louisiana Wild Life and Fisheries Commission who is stationed at Monroe. We had flown up with Chief Pilot Buck Davis and Staff Photographer Bob Dennie. Jimmie Thompson, Commission Chairman and well versed in catfish production, flew up from Alexandria to join us for a tour of several extensive catfish operations already in full production.

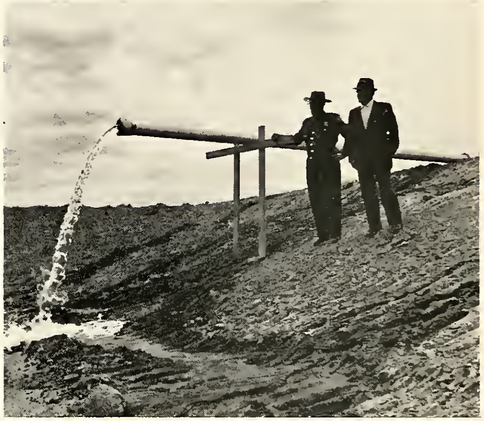
Over a cup of hot coffee in the District Office of the Commission in Monroe, Jim Davis told us that the supply of fingerling catfish and catfish in general was far less that the growing demand.

"Walter Jones, head of the Bureau of Commercial Fisheries at Ann Arbor, Michigan, told me that present production of catfish is about 15,000,000 pounds annually," Davis said. He also said, "there is immediate demand for 60,000-000 pounds and that will increase."

He predicted that in three years Louisiana could produce 30,000,000 pounds of marketable catfish and become the leading producer in the country.



Jim Davis, left, and Jimmie Thompson, chairman of the Louisiana Wild Life and Fisheries Commission, examine one of the "incubators" which are used to keep the water in constant motion after catfish eggs have been introduced. The fanning movement of powered blades keep the eggs from collecting debris and assures a near-total hatch.



In a new fishing farming operation at Lafayette, part-owner of the growing operation, Willie Landry shows Wild Life and Fisheries Agent E. J. Cormier water being pumped into a new pond. The Landry brothers started harvesting catfish on a limited basis last October. In November, an entire 5½-acre pond was harvested and produced about 12,000 pounds of delicious catfish, averaging from 1½ to 3 pounds. At a market value raw of 50 cents per pound, that represented in excess of $6,000 from 5½ acres.

Davis cited a number of reasons for this. First, Louisiana is blessed with plenty of flat land and deep wells. Those wells are located in the rice parishes and elsewhere there are artesian wells and springs.

"This is important in catfish farming, he said. "The use of water from streams or rivers could contain unwanted bacteria or pollution material that could wipe out an entire crop of fingerlings or marketable catfish."

It takes one year to get into full production but Davis hastened to explain that while catfish farming was growing at leaps and bounds, the business must be run in a businesslike manner.

"A single acre can produce $200 net profit, perhaps more," he said. "But the fact that catfish can be the most profitable crop in Louisiana today, surpassing cotton, soy beans and other cash crops, does not mean that anyone can bulldoze a batch of one-acre ponds four feet deep, introduce fingerlings and settle back for a year and then collect the harvest."

In his opinion, to be a commercial success, it takes at least 100 acres and a capital outlay of about $100,000. Persons with the necessary type of land can start out with a smaller capital outlay and put their profits, or a portion of them, back into expansion.

Raising catfish for market, or catfish fingerlings for sale, is a growing business with unlimited possibilities but those entering it must operate on a strict business like basis.

Where is the demand for catfish? There is a national demand for catfish that go a pound or slightly over. Current price is 50 cents a pound rough, and 90 cents a pound dressed. That's plenty of incentive to put acreage into catfish farming.

On the catfish farm owned by Dr. J. W. Cummings and managed by L. Ted Barnes, we had the opportunity to see how fast this catfish farming is growing. There are 15 acres in catfish ponds but two large dozers were working away at building additional ponds. Jim Davis told us the dozers were booked until August in that general northeast Louisiana area with the single job of scooping out four-foot deep one-acre ponds.

All of the bugs in catfish farming have not been worked out yet and Commission fisheries personnel, as well as established operators, are working on some of the problems. Take the holding sheds for example. These are merely open sheds with rows of concrete bins where both fingerlings and marketable catfish are held. Water is in constant circulation. Fish can be held for a week, but research is being done to extend that to two weeks.

Another important aspect to the holding procedure is that out-of-state buyers like to take on 10,000 pound shipments in their trucks. They can take loads of 6,000 pounds of fish but it cuts into the profits because there is a mentionable cost involved in trucking the fish to market.

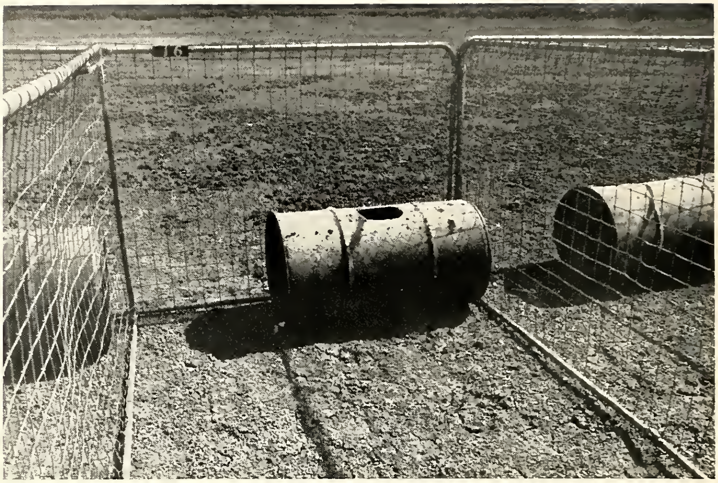
**Commission chairman Jimmie Thompson, biologist Jim Davis, and L. Ted Barnes, manager of the fish farm owned by Dr. J. W. Cummings of Monroe, look over a bulldozer crew in action creating more ponds. The bulldozer company is booked until August with nothing but fish pond contracts. That fact alone indicates how quickly catfish farming is growing.**

As for marketing catfish, some readers will wonder why the cost to the buyer averages 50 cents raw and about 90 dressed. That is because of the fact that catfish are difficult to skin out and filet. At the present time there are no catfish processing plants in Louisiana. Some catfish farmers are processing their own for retail sale, finding ready market. But there is no large processing plant and it could follow that as the catfish industry expands this will open the avenue for an important Louisiana industry.

Just how widespread is this fledgling industry?

**From seine at pond's edge to holding tanks for fingerling catfish and shiners, fish farmers try not to handle fish but once in a dip net. A pipe fitted to a tank valve sends thousands of shiners and fingerlings to the proper tanks.**

On the Delhi Fish Farm, Armstrong has 50 numbered cages such as this. When the catfish are ready to spawn, the shallow pond is flooded and pairs of breeding catfish are placed in each cage. The male catfish drives the female into the drum and actual spawning takes place inside. Each cage and drum is numbered so that workers can check daily for spawn. This is removed to the "shed" where rotary blades keep the water in circulation so that the eggs do not collect debris.



There are fish farms in Texas, Arkansas, Alabama, Missouri, Kansas, and Florida. Never-the-less, the demand for catfish and catfish fingerlings is far greater than the supply. Florida is a big buyer of fingerlings.

Davis explained on the tour that catfish spawn in June or July and that under present fish farming methods it takes about 10 months for them to reach market size. He said that in the stocking of a pond, there are two things that had to be considered.

If the catfish farmer is going to feed his fish, it is recommended that fingerlings should be stocked at the rate of about 2,000 per acre. If it is not desired to hand feed, operators should not stock more than 500 fingerlings per acre. As in the case of fed fish, the non-fed fish will reach approximately a pound in a year.

Marketable catfish run 12 to 13 inches. This netful represents a cash value to the catfish farmer of about $10. A one-acre pond, managed properly, can produce 2,000 marketable catfish within a year. After all costs are deducted, the net profit is $200 an area and sometimes more. Consequently, an acre of catfish represents a larger cash crop than any other agricultural crop.

It is preferable to stock only one species of fish. This is the channel catfish. Only exception is where blue catfish are also available. In that event, 10 per cent of the stocking could be blue catfish.

For those who feed their fish allowing maximum production per acre, pelletized feed is recommended. There are several commercial varieties on the market. The present operations indicate that it takes 1½ pounds of pelletized feed to produce a one pound catfish.

Regarding the marketing of pond-raised catfish, it has been observed that commercial marketing is generally off from Thanksgiving to the first of February. Locally, the spring markets may also be poor due to oversupply by commercial fishermen. The months of June through September are generally quite good for fish of one-half to two pounds.

Davis revealed that this is not true of fingerlings which are in great demand by fish farmers in neighboring states and as far up the line as Missouri and Kansas. In this instance, the fingerlings are desired for stocking "put and take" fishing areas where people fish for pleasure and pay a fee. Many of the places described formerly stocked trout and other species but have found more satisfied customers with catfish and bass.

Toward this end, the Commission's biologists are working on an accelerated spawning system to make a full crop in one year without the harvest being extended into the next year.

Davis feels that a steady supply of catfish is the secret of making money for those who enter this relatively new industry. It would also be of great use in the sale of fingerlings out-of-state. Under the system being used at present, water is heated and breeding pairs of catfish are stimulated to spawn earlier.

Spawn is collected and placed in a tank which is equipped with rotary blades which replace the normal fanning operation of the catfish. This keeps the eggs free of debris until they hatch.

This allows Louisiana's fish farmers to produce fry and subsequently fingerlings several months before normal reproduction takes place in mid-western states.

There's another angle to catfish farming that Davis explained. In controlled spawning—the spawning and collecting of eggs—there is a 10 per cent loss of eggs. This added to an additional 10 per cent loss for other reasons amounts to a total loss of 20 per cent from eggs to fish. This is a high degree of success compared to natural spawning in the wild where spawn cannot be collected and hatching supervised.

Breaking down some of the dollar and cents figures supplied by Jim Davis, take a catfish farmer with 10 one-acre ponds. If he feeds pellets, he can stock 2,000 fingerlings to the acre. That's a potential of about 20,000 marketable catfish, bringing 50 cents a pound. Assuming that all has gone well, that's roughly $10,000 of fish. Deducting the cost per fish of about six cents to feed, plus labor, and other expenses, that's a net profit to the average fish farmer in excess of $200 an acre.

Davis explained why he is convinced that catfish farms must be run like any other business. In most operations, fish farmers feed six days a week and take a day off on Sunday. Experiments have shown that by feeding seven days a week, there is a 15 per cent gain in weight in a given period. In plain language, 2,000 catfish in a one-acre pond fed seven days a week will weigh 15 per cent more than fish fed only six days a week.

Hitting on the dollars and cents angle again, 2,000 catfish which would have weighed a total of 2,000 pounds go on the scale at 2,300 pounds. At 50 cents a pound, that is $150 more per acre than would have been made if Sundays were days off. Multiply that by say 10 one-acre ponds and you come up with $1,500 more in cash profit.

**Janice S. Hughes, fisheries biologist in the laboratory at Monroe is shown injecting pesticides into tanks of fingerlings. Constant research goes apace with the catfish farming program. Part of this research is to determine the amount of pesticides catfish can tolerate and which brands of chemicals which they cannot tolerate at all.**

There are two important fringe benefits from this type of fish farming. One is the production of shiners for live bait and the other of frogs. At Collinston, we visited another catfish farm managed by Claudell Pamplin. He also has installed heated water tanks to accelerate early spawning. He also has shiner spawning trays which are flat wire trays filled with moss. The shiners spawn on the trays and practically all of the spawn is collected and hatched under the shed. Tanker trucks from all over the south speed

**This is a typical fish farm shed. Tanks hold catfish eggs where rotary blades keep the water in constant circulation. Other tanks hold fingerlings until they are desired for stocking. Still other tanks are heated in the early part of the year to stimulate early spawning.**

the flashy little fish alive to dealers where they are retailed to fishermen and are in great demand.

We also were shown a sack by Davis. There were perhaps a dozen big bull frogs in it.

"When I was out here yesterday," Davis remarked, "he had four sacks of 50 bullfrogs each, plus these. This is all that is left. The going rate is a flat dollar a frog, dressed. That's $200."

Pamplin's catfish operation at Collinston involves about 130 acres. He is presently expanding his operation and showed us new pumping facilities that were being installed to bring water in from the deep well.

After a visit with him for half hour, we piled back into the car and drove to the Delhi Fish Farm which is probably the largest in the state and will be until some big interests learn that catfish are the most profitable crop per acre, and will be for some time.

It's owned and operated by L. B. Armstrong. He is in the wholesale grocery business and also the fishing tackle field. Armstrong was waiting for us and gave us a big friendly smile.

"Sure glad you made it today," he said. "Everything I have in the ponds will be gone by the week end."

He was talking about 75 one-acre ponds where he is producing 10,000 fingerlings of catfish per acre. He wasn't referring to the 250,000 catfish that he is bringing up to market size in a 440-acre lake that he stocked.

We took a look and holding "shed" equipped with tanks and suspended air pumps and water circulators. He also had one of those rotary blade fixed devices that did the parent catfish's work following spawning. Many of the tanks were filled with shinners and others held catfish fingerlings.

"Let's walk down to the pond they are working. We're taking everything out and will ship 30,000 fingerlings this week end. That will give us a chance to draw down the water and get things ready to go back into production," he said.

On the way to where a tank truck was waiting, we stopped to walk down into a four foot deep pond that had been drained. Armstrong had set up some of his cagelike pens where pairs of adults were placed when they were ready to spawn. Each cage contained a drum in which a hole was cut to allow catfish to enter and spawn. Each was numbered.

"We keep the pens numbered," Armstrong explained, "because when there's water in here, you can't tell which pair has spawned. We check them daily and take the spawn to the rotary incubator. That way we have complete control over the eggs until we release or sell the fingerlings."

Armstrong runs 50 cage and drum combinations during the spawning season.

"We discovered that we can hold them well in the tanks and that gives us a tremendous supply of fingerlings," he explained. "It works like this. In the holding tanks, those fingerlings don't grow much. As ponds are seined for marketable fish, we can restock and put the pond back in operation. We're getting to the stage when we have a ready supply of fingerlings for sale to other fish farms for rearing, or we can rear them ourselves."

**These three catfish from left to right are Opelousas, blue and channel cats. They were taken from experimental tanks at the Commission's laboratory in Monroe for picture purposes. Fish farmers find that they get the fastest and maximum production from channel catfish.**

When he had finished explaining how the catfish spawn was taken for hatching, we walked down to the pond where the men were working. Wearing waders, they had corralled the fish into a pocket. The shiners were splashing on top and they were loaded into the three-tank truck first with a dip net and can. As soon as the truck was loaded, it returned to the shed and a six-inch pipe was attached to one tank at a time. When the rubber ball that sealed the tank was removed,

**Feeding is essential in catfish farming. With feeding of pellets an acre can produce 2,000 marketable catfish in a year. Without feeding, an acre pond cannot produce more than 500. Overstocking of ponds will stunt growth provided the fish are not fed. Average cost to bring a catfish fingerling to marketable size is 6½ cents in feed per fish. Current raw market value of 50 cents a pound clearly reveals that feeding is necessary for maximum growth.**

**These wire pads containing moss are used to collect spawn from shiners. The sale of shiners from catfish ponds is added revenue to the operator. Fish farmers capture the spawn in this fashion and claim that none is lost. The shiners are incubated in the same fashion as catfish fingerlings.**

fish by the thousands went streaming into one of the long holding tanks.

The truck returned for a tankload of catfish. They varied from three to five inches and larger—ideal for planting growing marketable size. They were still taking truckload after truckload when we left to catch the plane.

The last we saw of Armstrong, he was helping a dealer load a truck with shiners for distribution to fish dealers. They're just one of the byproducts of this new form of fish farming.

There's another large scale catfish operation in Lafayette and several others scattered throughout the state. There is no complete list of them because some are small, but growing, operations.

**Delhi Fish Farm is probably the largest in Louisiana. Operated by L. B. Armstrong who is also in the wholesale grocery business and operates a tackle store, this fish farm has 75 one-acre ponds for rearing fingerlings and a 440-acre lake where 250,000 catfish are being raised from fingerlings to marketing size.**

For the average rural reader, or any reader with a keen eye for business, it should be pointed out that this is not a simple operation where catfish fingerlings can be tossed into a pond and produce $200 profit. Fish farming is like any other business and must be run in a businesslike manner.

Jim Davis has spent years experimenting with catfish farming and has visited operations in other states. He has prepared an informative paper giving details on how this catfish farming can be successful. A copy can be obtained by writing to him at the Monroe District Office, Louisiana Wild Life and Fisheries Commission, P. O. 4004, Ouachita Station, Monroe, Louisiana. ✻

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## FISH HATCHERIES

*(Continued from page 9)*

placed in a pond at the Lacombe Hatchery to study their growth and development. If operations progress according to plans, the Lacombe Fish Hatchery is to be converted into an anadromous fish hatchery. Anadromous fish are species that can live in both salt and fresh water, moving from the salt water inland to reproduce. This will be a great stride in the creation of an additional sport fishery in our state.

A third species which is not under study in the hatcheries at present, but should be mentioned since it was introduced into D'Arbonne Lake during the spring of 1965, is the walleye. During the latter part of April 1965, fisheries biologists, travelled to North Platte, Nebraska to pick up two million green, fertilized walleye eggs to be hatched by jar culture methods at the Monroe hatchery. The green eggs were in plastic bags packed in trays on ice. Various other techniques were used to determine the best method for transportation. Upon arrival at the Monroe Hatchery the eggs were placed in hatching jars with water which was kept well aerated and at a constant temperature. The eggs were treated for fungus and bacterial organisms at frequent intervals. Unfortunately this hatching attempt was unsuccessful. The distance the eggs were transported seemed the primary cause of failure. They were brought a little over one thousand miles and no one has ever successfully hatched green eggs that were transported a distance such as this. Technicians of the Nebraska Game and Fish Commission also believed this the primary reason our experiment was unsuccessful.

In addition to the eggs, however, 1,000,000 fry were received from Nebraska Game and Fish Commission and 1,000,000 fry were received from the Georgia Game and Fish Commission. These 2,000,000 fry were placed in D'Arbonne Lake directly upon receipt. They were not reared in ponds as were the striped bass. Plans are to stock D'Arbonne Lake three years in succession with walleye fry, in order to establish a self-sustaining, harvestable population of this highly desirable sport fish.

There is one other project underway at Beechwood and Lacombe Fish Hatcheries. This is the bullfrog rearing project. This project was initiated some three years ago, but a lack of space, time and a shortage of personnel prohibited carrying out an adequate program. The study is designed to determine if bullfrogs can be grown economically for market. Brood stock was selected from wild stock and seemed to produce readily in enclosures. We only had two ponds in the beginning and this seriously handicapped the program. At present, there are eleven ponds scheduled for use in the study. The frogs will be spawned and reared from the tadpole stage to commercial size in these enclosures. Methods will entail different feeding rates, type of feed and different stocking rates. Since this spring will more or less be the starting point of this program, the results of the project will be made available at a later date.

Hatchery reared fish are made available to the public through application. Applications can be obtained from any one of our eight district offices. Applications for fish are also designed for persons interested in obtaining advice concerning the management of farm ponds for sport fishing. Upon receipt of the application, proper steps will be taken to give the interested pond owner advice required for managing the pond for sport fishing. There is a waiting period when individual ponds are checked to determine status of the existing fish population. This can only be done during the spring and summer months when all of the species in the pond have had a chance to reproduce.

Bluegill and bass are the only species stocked in private ponds with the exception of black crappie. This species is offered to pond owners if the pond is ten surface acres or larger and has at least one fourth of the area deeper than eight feet. Thus far, channel catfish production is so limited they are only stocked in public waters. Also, they will not successfully reproduce in small ponds.

Commission policies are to stock only new impoundments or impoundments that have been reclaimed by destroying the existing population. The only exceptions to these procedures are in the case of adding a new species to a lake, or by a supplemental stocking to build up a certain species to a desired level. This type of stocking is done only after careful examination of the body of water by a commission fisheries biologist.

Our hatcheries are open to public inspection and we welcome your visit. Fisheries conservation is a program close to all of us and public support is necessary to the enhancement of Louisiana's sport fishery resources. ✠

## WILDLIFE SHORTS

The Louisiana harmless hog snake, alias "Stinging Snake" "Hoop Snake", neither makes hoops nor does he sting.

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Those sleek and sometimes brightly colored little fellows who race about in the gardens and woods in Louisiana who have been scaring the daylights out of people for years under the false names of "Scorpions" really are harmless slick-skinned lizards known as Skinks.

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Since oysters grow very rapidly in warm southern waters, oyster production in Louisiana is an annual crop and the average age of the oyster when marketed is 18 to 30 months.

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The immobile character of the oyster in Louisiana, and elsewhere, necessitates that its food must come to it. Oysters feed by circulating 50 to 100 gallons of water over the mouth daily to filter out planktonic food organisms.

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The spotted weakfish, known as speckled trout, is the small game of the Louisiana coastal waters. It averages in size from 2-5 pounds, however "specks" over 16 pounds have been reported.

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The raccoon, an abundant inhabitant of all terrains, timbered, swampy, marshy etc., is found throughout Louisiana. It ranges in size from 26 to 38 inches.

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The food of the Louisiana raccoon consists of plant and animal matter—wild fruits (persimmons, oranges, blackberries, acorns, pecans, crayfish, clams, fish frogs, snails, etc.)

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The oyster dredge is the oyster fisherman's plow and expedites the harvesting of Louisiana cultivated oysters. Some luggers operate as many as four of these dredges.

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As little as one to two parts per million of oil in water will be concentrated in the oyster to a point that it is made inedible.

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A female speckled trout, caught in Louisiana waters, which was 19 inches long contained 428,000 eggs, and one 24½ inches long contained 1,118,000 eggs. They first spawn when 3 years old.

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Louisiana leases for oyster growing bottoms are surveyed, mapped and recorded by the Louisiana Wild Life and Fisheries Commission with official recordation in parish seats. Lease holders pay the State one dollar per acre annually for such leases.

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The den of the Louisiana raccoon can be found in hollow trees or abandoned squirrel nests, muskrat houses, slough grass, haystacks and abandoned burrows. Dens are also located in maple, elm, oak and sycamore trees.

# The Bird of the month

## BARRED OWL

*Strix varia*

**Charles R. Shaw**

THIS IS PROBABLY Louisiana's most commonly seen (and heard) owl but unfortunately the one whose body is most often seen along the highways of the state. It is a fact that the "Hoot Owl" may be found in almost any patch of woodland and Audubon is reported to have said concerning it, "In Louisiana it seems to be more abundant than in any other state." Actually, of course, due to its nocturnal habits, it is probably much more often heard than seen.

This bird is not too hard to distinguish from the other nine owls which may occur in our state, being a relatively large brownish colored owl with no tufts on the head, buffish white underparts with the breast distinctly barred, (whence the name) and the belly and sides streaked with dark brown. The eyes are very dark, a feature shared only by the unmistakeable barn owl among the other nine kinds, and with a yellow bill which with the dark eyes stands out quite distinctly in the almost heart-shaped facial disc.

However you don't even have to see this bird to identify it since the weird sounds, usually in groups of eight or more "hoots" leave little doubt as to the source. Distinct calls may somewhat resemble the barking of a dog. Occasionally a blood-curdling wail or scream may be added to the more familiar hoots. Several owls answering each other can fill the woods with eerie sound. These birds will often answer human imitations of the call as well. If it is in daytime, and these owls are about during the day more than some of the others, crows may move in to torment their old enemy.

Owls are early nesters and the two to four round white eggs are laid no later than February. The nest is usually a hollow in a tree or large limb, although on very rare occasions the abandoned nest of a hawk or crow may be utilized.

The young owlets are hatched with their eyes closed and are fairly well covered with soft white down. Their eyes open in about one week and the white natal down is replaced in two or three weeks by the beginning of a second covering having some buffy color which might be called the first downy plumage. The general appearance becomes more brownish as the feathers are acquired and as the maturing birds go into their first winter plumage.

The diet of the barred owl is made up primarily of various species of mice and rats although a wide variety of food has been recorded, even including other owls. In addition to the aforementioned small mammals the "Hoot Owl" also occasionally includes such items as small birds, frogs, lizards, small snakes, crawfish, fish, large insects, etc.

While it is true that an occasional individual may take a small chicken if the opportunity presents itself, the food habits are largely beneficial and of course the Barred Owl is protected by Louisiana law, as are all the rest of the owls except the Great Horned Owl.

Our predatory birds, both diurnal and nocturnal exert great pressure on the populations of small rodents and serve in some measure to assist in the control of these in the balance of nature. The quail hunter perhaps does not realize that the common cotton rat is much more harmful to his quail population, for example than the hawks and owls, since it competes directly for the same foods as well as destroying the eggs. However the fact that the majority of our owls and hawks are extremely beneficial seems to be a truth that the majority of the people find as hard to understand as they do the fact that it is necessary to harvest both sexes of deer if we are to keep our deer herds in balance with the available range. ✠

**RETURN REQUESTED**
*Louisiana Wild Life and Fisheries Commission*
*400 Royal Street*
*New Orleans, Louisiana 70130*

# BASS FISHING IN LOUISIANA IS FINE SPRING, SUMMER AND FALL SPORT

## A Trophy Bass

Because of its numerous ponds, lakes, rivers, bayous and flowing streams, there is no difficulty in catching bass in Louisiana. Every body of fresh-water and many brackish coastal lakes contain plenty of bass. It's the most sought-after freshwater fish in the country. This trophy bass was caught recently by L. D. Blaylock of Baton Rouge and tipped the scales at 8 pounds, 2 ounces. You don't get them this big often but Louisiana bass fishermen take plenty of fish.